



FREQUENTLY ASKED QUESTIONS (FAQs) ABOUT TRIHALOMETHANES (THMs)

Q What are trihalomethanes?

- A. Trihalomethanes (THMs) are common contaminants of chlorinated drinking water, formed when chlorine reacts with the organic substances which naturally occur in raw water. The most common THM components formed during chlorination include chloroform, bromoform, bromodichloromethane, and chlorodibromomethane.

Q Why is drinking water chlorinated?

- A. Drinking water is often chlorinated to kill bacteria, viruses, and some protozoans that could cause serious waterborne infectious diseases. Protozoans such as Giardia and Cryptosporidium are generally not killed by chlorine concentrations normally used in water treatment plants (free chlorine residual: 2-3 milligrams per liter; mg/l). Filtration is the most practical method to achieve removal/ and inactivation rates of Giardia cysts and Cryptosporidium oocysts.

Q At what levels are THMs present in drinking water?

- A. The THM concentrations in tap water can vary greatly from place to place, and from time to time, depending on the source of the water, how it is treated, and other factors. Waterworks that draw water from surface water (lakes, rivers, and reservoirs) produce water with higher levels of THMs than waterworks with groundwater (wells and springs) as their source of water. Tap water THM levels range from 0.030 to 0.15 mg/l in surface water and 0.001 to 0.010 mg/l in groundwater.

Q How might I be exposed to THMs?

- A. The most likely ways people are exposed to THMs are by drinking chlorinated water, and by breathing vapors released from chlorinated water in a swimming pool.

Q How can THMs affect my health?

- A. One epidemiological study via the ingestion route points towards an association between THMs (greater than or equal to 5 glasses per day containing greater than or equal to 75 micrograms per liter for 3 months) and miscarriage, although the evidence is not conclusive. There is no evidence that long-term exposure to low levels of THMs causes any harmful effects in people.

Animal studies indicate that ingesting large amounts of THMs can cause damage to the liver, kidney and central nervous systems. The effects on the central nervous system appear quickly after exposure to high doses and include sleepiness and incoordination. There is some evidence from animal studies that THMs may cause birth defects at high enough doses. It is not known if lower doses would cause birth defects.

Q How likely are THMs to cause cancer?

It is not known whether THMs cause cancer in people. There is evidence that ingestion of large amounts of THMs causes liver, kidney, and intestinal cancer in experimental animals. The Environmental Protection Agency (EPA) has determined that three THMs (chloroform, bromoform, and bromodichloromethane) are classified as probable human carcinogens (Group B₂). Group B₂ indicates that there is "sufficient" evidence of carcinogenicity in animals with inadequate or lack of evidence in humans. There may be an increased risk of liver or kidney cancer following 70 years of high THM exposure.

Q Are there any standards or guidelines to protect the public from exposure to THMs?

- A. The EPA has set a Maximum Contaminant Level (MCL) for total THMs in drinking water at 0.1 mg/l in the average of samples collected within the drinking water systems during four consecutive quarters. To reduce potential exposure, this MCL will be lowered to 0.08 mg/l effective December 31, 2001 for waterworks serving 10,000 persons or more and effective December 31, 2003 for waterworks serving less than 10,000 persons.

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Q. What happens to THMs when they enter the environment?

A. THMs released to air are slowly broken down by reactions with other chemicals and sunlight, or they can be removed by rain. In water, they will evaporate to the air and/or are broken down slowly by bacteria. When released to soil, most evaporate to the air but some are broken down by bacteria. THMs do not build up in the food chain.

Q. Where can I get more information?

A. For more information, contact the Virginia Department of Health, Division of Health Hazards Control, 1500 East Main Street, Room 124, Richmond, VA 23219; Phone: 804-786-1763.

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